

Subject: Recommended guidelines and procedures for disinfecting public freshwater swimming pools and spas after fecal accident

Purpose The purpose of this letter is to provide public pool operators recommended procedures and guidelines to follow in the event of a fecal accident. The revised recommended procedures are applicable to all types of public freshwater pools (i.e. swimming, wading, spas, special use).

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Background Fecal accidents in public freshwater pools can lead to the transmission of serious illness from microorganisms such as Giardia, Cryptosporidium and E. coli O157:H7. Precautionary measures should be taken to help reduce the risk of illness to pool users.

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Minimum Requirements Hawaii Administrative Rules, Title 11, Department of Health, Chapter 10, Public Swimming Pools, requires minimum chlorine residual be at least 0.6 parts per million (ppm) and maintain an alkaline condition as indicated by a pH between 7.2 and 7.8 for all public freshwater swimming pool. The pool should not be open for use unless the filtration and automatic disinfection equipment are operating. If proper recirculation or disinfection cannot be maintained, close the pool.

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Guidelines & Procedures The Department of Health has established recommended procedures and guidelines to follow after a fecal contamination occurs at a public swim/spa pools. These are based on the California Health and Safety Code and the Centers for Disease Control and Prevention newly released recommendations for the management of fecal accidents at public pools. The document relaxes the requirements for water treatment at public pools in event of "formed stool accidents."

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IN THE EVENT OF A FECAL ACCIDENT, INITIATE THE FOLLOWING PROCEDURE:

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Close pool and remove material

When a fecal accident occurs, close the pool(s) and instruct all pool users to exit the pool(s) immediately. Do not allow anyone to enter the contaminated pool(s) until all the following steps are completed.

Remove as much of the fecal material as possible using a net or scoop and dispose of it in a sanitary manner. Clean and disinfect the net or scoop (i.e., after cleaning, leave the net or scoop immersed in the pool during the disinfection period.) Vacuuming stool from the pool is not recommended. If the pool is vacuumed, waste should be directed to a sanitary sewer and not through the filtration system.

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Stool or diarrhea Cl level

If the fecal accident involves a “formed stool” (solid, no liquid), raise the chlorine residual to 2.0 ppm (parts per million) while maintaining pH levels between 7.2 and 7.8 for at least 25 minutes. If a chlorine residual of 3.0 ppm is present the time may be reduced to 19 minutes.

If the fecal accident involves “diarrhea or a loose stool,” raise the chlorine residual to 20.0 ppm while maintaining pH levels between 7.2 and 7.8 for at least 8 hours. This is equivalent to a contact time (CT) value of 9,600. The CT value is the concentration of chlorine residual in ppm multiplied by the time in minutes. For example, a chlorine residual of 20.0 ppm maintained in a pool for 8 hours (480 minutes) will result in a CT value of 9,600 [480 minutes x 20.0 ppm = 9,600 CT]. Any combination of chlorine residual and time resulting in a CT value of 9,600 or greater is adequate.

For fecal accidents involving “diarrhea or loose stools,” the filter should be thoroughly backwashed to a sanitary sewer after the CT value has been reached and before pool is reopened.

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## pH and reopening

During the entire treatment period, pH should be maintained between 7.2 and 7.8. The pH may be affected if additional chlorine is added to the pool. Ensure that the filtration system is operating and the proper chlorine residual is maintained throughout the treatment period. Ensure that the chlorine residual is found throughout all areas of the pool or co-circulating pools by sampling in at least three widely spaced locations away from returned water inlets.

The pool may be reopened after the required CT (contact time) value has been achieved and the chlorine residual is below 5.0 ppm.

If the pool is a low volume pool, such as a spa pool or wading pool, the pool can be drained. The pool should be refilled, the water balanced and the proper time/concentration or CT value achieved before being reopened.

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## Log accidents

Establish a fecal accident log which shall be kept at the pool site. Document each fecal accident by recording the following information:

- a. Date
- b. Time of the event
- c. Formed stool or diarrhea
- d. Chlorine residual concentration and pH at the time of observation of the event
- e. Chlorine residual and pH before reopening the pool
- f. Contact time
- g. Procedures followed to respond to the fecal accident, including the process used to increase the chlorine residual if necessary.

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## Vomit accident

In the event of contamination with vomitus in a pool, the procedures for a "formed stool" should be followed.

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## Notes and references

- The above fecal accident pool closure procedures are based on recommendations by the California Health and Safety Code and the Centers for Disease Control and Prevention. (May 2001)
  - All contact times (CT) assumes a water temperature of 77°F (25°C).
  - Non-chlorine disinfectants are not addressed and should not be used because there is limited pathogen inactivation data available for these compounds.
  - The impact of chlorine stabilizers such as chlorinated isocyanurates on pathogen inactivation and disinfection measurements is unclear and warrants further investigation. Increased contact time may be desirable.
  - Many test kits cannot measure the chlorine residual in a range that includes 20.0 ppm. Use chlorine test strips or kits that can measure in this range.
  - High levels of chlorine may damage pool equipment. Exercise caution or consult with an experienced aquatic professional.
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